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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/715,775

11/17/2000

Sun-Chueh Kao

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10/17/2003

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EXAMINER

LEE, RIP A

ART UNIT

PAPER NUMBER

1713

DATE MAILED: 10/17/2003

14

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/715,775

Applicant(s)

KAO ET AL.

Examiner

Rip A. Lee

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on March 10, 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-33, 37-47 and 51-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-33, 38-47, 52 and 53 is/are rejected.
- 7) ☒ Claim(s) 37 and 51 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 13.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

- This office action follows a request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), filed on March 10, 2003.
- The accompanying information disclosure statement (IDS) has been considered.
- The indicated allowability of claims 23-33, 37-47, and 51-53 (Paper No. 11) has been withdrawn in reconsideration of references, EP 0 578 838 to Herrmann *et al.*, U.S. Patent No. 5,674,795 to Wasserman *et al.*, and U.S. Patent No. 6,239,058 to Shamshoum *et al.* Rejections based on these references follow.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 23, 24, 25, 28, 33, 40, 41, 44, and 47 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 0 578 838 to Herrmann *et al.*

The present invention relates to a process for polymerizing olefin(s) comprising the steps of (a) preparing a catalyst composition by the steps of combining the following components: (i)

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first combining a catalyst compound and supported alumoxane, (ii) followed by combining an ionizing activator or a trisubstituted B, Te, Al, Ga, In compound, and (b) contacting the catalyst composition with olefin(s).

Herrmann *et al.* teaches a process contacting a metallocene catalyst component with a supported organoaluminum compound in which the organoaluminum compound is prepared by suspension of a support in a solution of trialkylaluminum and hydrolyzing the suspension by addition of water (claims 1 and 2). As is known in the art, hydrolysis of trialkylaluminum such as Me₃Al results in the formation of methylalumoxanes (Examples 1 and 2). The inventors show that another trialkylaluminum can be added to the polymerization system prior to polymerization (page 13, lines 21-24). Such a process would be essentially the same as that recited in the present claims. According to the examples, combination of metallocene with supported alumoxane takes place for at least ¼ hour (page 14, line 35). Materials are combined in hydrocarbon diluents such as toluene and diesel oil (Example 1 and 2).

3. Claims 23-28, 30, 33, 38-42, 44, 47, 51, and 53 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,674,795 to Wasserman *et al.*

Wasserman *et al.* teaches a process for polymerization of olefins in the presence of a catalyst composition comprising a metallocene compound, a cocatalyst, a particulate filler and diluent (claim 1). Specifically, the first step involves combining metallocene DPZ with MAO supported on silica (col. 12, lines 2-5). In the second step, the resulting mixture is combined with aluminum alkyl co-catalyst in hexane (col. 12, lines 37-39). Finally, the last step requires contact of the resulting catalyst with olefin to effect polymerization. In sum, the reference teaches essentially the same process set forth in the present claims.

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According to the text, a stirring time of 2 hr was used for supporting MAO on silica, and a stirring time of 16 hr was used for combining metallocene and MAO/SiO₂ (col. 12, lines 4 and 7). The catalyst is slurried in Kaydol[®] which is a mineral oil having a flash point greater than 200 °F (see Table II). The catalyst can be adapted for slurry and gas phase polymerizations (col. 12, line 56).

4. Claims 23-30, 33, 38, 40-44, 47 and 52 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,239,058 to Shamshoum *et al.*

The prior art of Shamshoum *et al.* relates to a process for production of polyolefins using a metallocene catalyst supported on silica treated with MAO. The invention includes contacting the supported catalyst with a trialkylaluminum and aging the catalyst for 12-24 hr prior to polymerization (abstract). The catalyst is prepared in mineral oil (Examples).

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Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 31, 32, 45, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shamshoum *et al.* in view of U.S. Patent No. 6,066,703 to Reichle *et al.*

Shamshoum *et al.* does not teach combining the catalyst with a cycloalkadiene compound. Reichle *et al.*, however, show that addition of cycloalkadienes such as cyclopentadiene, indene, fluorene and its derivatives (see Tables I-V, examples 1-48) to a catalyst composition is beneficial for enhancing catalyst activity. Therefore, one having skill in the art would have found it obvious to add cycloalkadienes of Reichle *et al.* to the catalyst Shamshoum *et al.* in order to arrive at the present claims. Since this process is shown to work in the prior art, one would expect the modified catalyst of Shamshoum *et al.* to exhibit enhanced activity as well, thereby providing the requisite motivation for combining references. *In re O'Farrell*, 7 USPQ 2d 1673 (Fed. Cir. 1988).

Allowable Subject Matter

8. Claims 37 and 51 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The subject matter of these claims would be allowable because none of the cited references discloses use of ionizing activators of general formula $[LH^+][A]$ in lieu of the second trialkylaluminum component. Instead, the prior art contemplates use of ionizing activators as an alternative to aluminoxanes; therefore, the skilled artisan would not find it obvious to use the combination of supported MAO followed by ionizing activator $[LH^+][A]$, as recited in the present claims.

Information Disclosure Statement

9. A summary of the contents of the references appears below.

(i) EP 0 481 480 describes a catalyst system comprised of metallocene, ionizing activator, and organoaluminum components. There is no teaching of the use of supports, let alone use of supported alumoxane.

(ii) EP 0 500 944 teaches a catalyst system prepared by combining metallocene and organometallic compound followed by contact with ionic or electrophilic compound. The catalyst may be supported on $MgCl_2$. The reference neither teaches nor contemplates use of supported aluminoxane.

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(iii) EP 0 513 380 teaches a catalyst composition comprised of metallocene, ionizing activator, and organoaluminum components. There is no teaching of the use of supports, let alone use of supported alumoxane.

(iv) EP 0 522 581 relates to polymerization in the presence of a catalyst prepared by supporting metallocene, trialkylaluminum, and ionizing activator on silica. The reference is devoid of any teaching using alumoxanes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (703)306-0094. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (703)308-2450. The fax phone number for the organization where this application or proceeding is assigned is (703)746-7064. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

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October 15, 2003



DAVID W. WU
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